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October 4, 1999

BY HAND DELIVERY

Ms. Magalie R. Salas
Secretary
Office of the Secretary
Federal Communications Commission
The Portals TW-A325
445 12th Street, SW
Washington, DC 20554

Re: Amendment of Part 15 of the Commission's Rules Regulating Spread Spectrum Devices
ET Docket No. 99-231
Our File 09834/003001

Dear Ms. Salas:

Enclosed please find an original and four (4) copies of comments submitted on behalf of the **International Microwave Power Institute (IMPI)** in the above-captioned proceeding. If you have any questions or concerns regarding this filing please contact me directly.

Very truly yours,

Terry G. Hahn

/bab
Enclosures

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
Amendment of Part 15 of the Commission's Rules Regulating Spread Spectrum Devices	)	ET Docket No. 99-231

To: The Commission

COMMENTS OF INTERNATIONAL MICROWAVE POWER INSTITUTE

International Microwave Power Institute ("IMPI"), through its counsel, hereby submits the following comments in response to this Notice of Proposed Rulemaking ("NPRM"). IMPI objects to the Commission's proposal to increase the operational bandwidth for unlicensed devices operating in the 2.45 GHz band. If such proposal is adopted, the Commission will unwittingly create new and intolerable RF interference problems for scores of consumers. Microwave ovens installed in 100 million American homes will suddenly and irrevocably become a new source of interference to consumer Part 15 devices. Not only will this unfairly put consumers in the middle of a spectrum conflict not of their own choosing, but it will fly in the face of Congressional legislation adopted specifically to avoid such problems.[1] Accordingly, IMPI urges that the Commission either abandon the current NPRM or adopt companion rules that will significantly increase the immunity/rejection capabilities of 2.45 GHz spread spectrum devices from microwave oven emissions.

[1] See 47 U.S.C. §302(a)(2).

INTRODUCTION

IMPI is the oldest international organization involved with ISM issues. IMPI was founded in 1965 to promote the education, research, development and application of electromagnetic technologies, specifically microwave and RF. Since its founding, IMPI has become the largest non-profit information resource for ISM technologies with over 700 members and subscribers worldwide. IMPI has been previously active in numerous Commission proceedings involving ISM band issues.[2]

As the Part 15 manufacturing sector is well aware, the internationally allocated ISM bands are open to unlicensed spread spectrum usage in the United States on a sufferance basis to ISM. Over the years, the Commission has cautioned spread spectrum manufacturers about the "heavy interference from [ISM],"[3] conditioned band usage on the acceptance of "any interference which [ISM] may cause to their own operations,"[4] and warned of the "dangers" to communications devices from ISM emissions.[5] When the Commission rewrote its Part 15 Rules in 1989, it noted that "certain consumer devices" might not be suitable for operation in ISM bands.[6] More recently, when the Part 15 industry sought to amend the spread spectrum rules to provide greater

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[2] IMPI has been a tireless advocate against any Part 15 expansion in the ISM bands that are likely to lead to in-band limits on ISM or complaints of ISM interference. (See, e.g., IMPI Comments in ET Dockets 98-6, 98-102 and 98-156). Recently, IMPI opposed a Petition for Rulemaking filed by the Millimeter Wave Communications Working Group proposing to set limits in the 61.25 GHz ISM band. IMPI also actively "watchdogs" international standards proceedings involving ISM band usage by telecommunications entities.

[3] In the Matter of Authorization of Spread Spectrum and Other Wideband Emissions Not Presently Provided for in the FCC Rules & Regulations, Notice of Proposed Rulemaking, Gen. Docket No. 81-413 (Docket No. 81-413 NPRM"), 49 Fed. Reg. 21951, ¶ 24, May 1984.

[4] In the Matter of Authorization of Spread Spectrum and Other Wideband Emissions Not Presently Provided for in the FCC Rules & Regulations, First Report & Order, Gen. Docket No. 81-413, 58 RR 2d 251, 256, ¶ 24, May 1985.

[5] Id. ¶ 26.

[6] In the Matter of Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices without an Individual License, Gen. Docket No. 87-389, First Report & Order, 54 Fed. Reg. 17710, ¶ 58, April 1989.

range and higher data rates, the Commission reminded manufacturers that it would be incumbent upon them to design their devices to be capable of rejecting interference from ISM operations.[7]

Despite these and similar Commission warnings going back to 1981, Part 15 manufacturers have continued to develop devices that are highly susceptible to interference from ISM and, in many environments, are spectrally incompatible with ISM operations. Instead of the "low power" and "local area" devices originally envisioned by the Part 15, today's manufacturers are developing city-wide systems capable of communicating at distances of 50 miles or more. And instead of hardening these systems to interference from priority spectrum users, manufacturers have aggressively sought greater range, increased mobility and more bandwidth for their Part 15 device operations. The result has been a growing chorus of user interference complaints and, more recently, petitions to the FCC seeking protection for Part 15 devices from licensed and other senior spectrum users.

In the 915 GHz ISM band, for example, LMS licensees have been the source of Part 15 device interference complaints;[8] in the 2.45 GHz ISM band, RF lighting[9] has recently been under attack; and in the 61.25 GHz ISM band, a group of unlicensed device manufacturers has pushed for stringent limits on ISM emissions.[10] Slowly, the Commission's regulatory paradigm for ISM band usage has shifted without basis or explanation and in violation of established domestic and international[11] policies. Because the NPRM threatens to further shift this paradigm, IMPI urges the Commission not to adopt any rule changes that might further burden 2.45 GHz ISM band users and manufacturers with complaints of interference to Part 15 devices.

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[7] See In the Matter of Amendment of Parts 2 & 15 of the Commission's Rules Regarding Spread Spectrum Transmitters, Gen. Docket No. 96-8, First Report & Order, 62 Fed. Reg. 26239, ¶¶ 14, 17, April 1997.

[8] See Automotive Vehicle Monitoring Systems, 10 FCC Rcd. 4695 (1995).

[9] See Amendment of Part 18 of the Commission's Rules to Update Regulations for RF Lighting Devices, ET Docket No. 98-42.

[10] See Petition for Rule Making by Millimeter Wave Communication Working Group, March 2, 1999.

[11] ISM bands are established under ITU treaty. See Amendment of Part 2 re Implementation of the Final Acts of the World Administrative Radio Conference, Geneva, 1979, Second Report and Order, 54 RR2d 1500 (1983).

I. The Proposed Rules Will Increase ISM Spectrum Interference From Microwave Ovens.

By increasing the operational bandwidth for 2.45 GHz spread spectrum devices intended specifically for residential use,[12] the Commission will foment a direct spectrum conflict with an installed base of 100 million microwave ovens. Per international treaty,[13] as reflected in the Part 18 Rules, microwave ovens are permitted to emit RF energy without limitation in the 2.45 GHz band. While emissions from these devices vary greatly depending on the load, they have been measured in excess of 100 dBuV/m (at 3 meters). Based on Part 15 data provided recently in other Commission proceedings, it is now understood that spread spectrum devices will suffer unacceptable interference levels from ISM signals of even lower magnitude at distances in excess of 70 meters.[14] IMPI has grave concerns, therefore, that because most residential environments may already be inhospitable to spread spectrum device usage, any rule change which increases the susceptibility to microwave oven emissions will only exacerbate this situation.

When Part 15 spread spectrum devices were initially authorized to use the 2.45 GHz band the Commission assumed, perhaps incorrectly, that the technology was capable of co-existing with ISM. In its 1981 Notice of Inquiry in Docket No. 81-413, the Commission described how spread spectrum systems could "provide an interference rejection capability not possible with conventional mandated systems," and how the strength of any interfering signal "could be reduced by the system's processing gain."[15] Subsequently, in the Notice of Proposed Rulemaking in that docket, the Commission warned spread spectrum manufacturers of the "heavy interference" from ISM band usage[16] as it adopted signal rejection rules in the form of processing gain

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[12] See NPRM ¶ 6.

[13] See fn. 11, supra.

[14] See fn. 9 supra. Ex parte comments filed on March 2, 1999 by the Part 15 Interests computed a 70m separations requirement for ISM emissions at 86 dBuV/m at 3 meters.

[15] Docket No. 81-413 NOI, ¶ 19.

[16] Docket No. 81-413 NPRM, ¶ 24.

requirements for direct sequence systems and narrow band (25 kHz) operating channels for frequency hopping systems.

A few years later, in response to intense Part 15 industry pressure, the Commission revised its spread spectrum rules to increase the operating channels for frequency hopping systems to 1 MHz.[17] The issue was addressed again in ET Docket 96-8[18] when one manufacturer petitioned for a rule change to increase the bandwidth to 5 MHz to facilitate high data speed LANs.[19] Several parties opposed the request, noting that "the use of wider bandwidth transmissions would significantly reduce the processing gain and interference rejection capabilities of frequency hopping systems."[20] The Commission accepted these arguments and decided not to increase operating channel bandwidths, stating that "there appears to be sufficient spectrum, either currently available or under proposal, to support high data speeds for wireless local area networks [citing 5 GHz of spectrum opened in the 56-64 GHz band].[21] In other words, just over two years ago, the Commission rejected the proposal to increase hopping channel bandwidths out of a concern that this would reduce a spread spectrum systems' ability to reject interfering signals from ISM and other devices.

The Commission's concern that spread spectrum devices maintain a high rejection capability in the face of ISM and other emissions was articulated in its original spread spectrum decision in 1985,[22] reiterated in the 1997 rule amendments[23] and even noted in the current

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[17] See In the Matter of Amendment of Parts 2 & 15 of the Rules with Regard to the Operation of Spread Spectrum Systems, Gen. Docket No. 89-354, First Report & Order, 55 Fed. Reg. 28760, June 1991.

[18] Notice of Proposed Rulemaking, ET Docket 96-8, February 1996.

[19] Id. ¶ 18.

[20] Id. ¶ 21.

[21] Id. ¶ 24.

[22] See First Report & Order, Gen. Docket No. 81-413, ¶ 26.

[23] See Report & Order, ET Docket No. 96-8, ¶ 17.

NPRM.[24] An increase in hopping channel bandwidths as proposed herein, would achieve the opposite result. Wider channels will decrease the inherent ability of spread spectrum systems to reject ISM emissions which will, in turn, increase RF interference problems in residential environments. Clearly, the public interest cannot be served by such rule change.

II. The Communications Act Makes Clear That Consumers Should Not Be Put in the Position of Having to Select Between Incompatible Uses of the Spectrum.

Devices which use the RF spectrum will, on occasion, interfere. This is an unfortunate, but generally tolerable, byproduct of the electronic age in which we live. The Part 15 rules recognize this fact as well as the propensity for unlicensed devices to cause interference to priority spectrum users; accordingly, technical standards and operating requirements for Part 15 devices are designed to protect licensed services and, indirectly, the spectrum using public. When users are exposed to RF interference via a rule proposal like the one herein, however, which fundamentally pits one device against another so that the two cannot operate compatibility in the intended common environment, the Commission must resolve the matter.

In 1997, Section 303 of the Communications Act was added to guide the Commission when managing the spectrum for "flexible use."[25] The statute does not specify how the spectrum is to be managed but it simply directs the Commission to avoid harmful interference among users. In the context of consumer electronics, Section 303 must be read so as to fulfill

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[24] NPRM ¶ 9 fn. 6.

[25] 47 U.S.C. § 303(y)(2)(c). See Rule 2.1. IMPI submits that regardless of how that term "harmful interference" is defined in the Commission's Part 2 rules, the plain meaning is to protect consumers from incompatible spectrum demands.

also, the legislative intent underlying Section 302 of the Act, which gives the Commission authority to adopt performance standards for household electronic equipment "to reduce their susceptibility to interference from RF energy".[26] To give effect to these clear Congressional directives the Commission is obligated to look carefully at the susceptibility of residential Part 15 devices and consumer microwave oven emissions in this NPRM, and either abandon the current proposals or develop companion rules that increase the rejection capabilities of spread spectrum systems operating in the 2.45 GHz band.

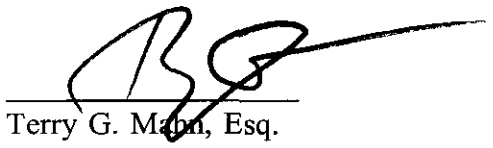
CONCLUSION

Based on the foregoing, IMPI urges the Commission to move cautiously with any rule change involving spread spectrum devices in the 2.45 GHz so as not to exacerbate their already existing susceptibility to ISM emissions. The public interest demands that consumers not be placed in an untenable position of having to choose between incompatible spectrum using devices.

[26] 47 U.S.C. 302(a)(2).

Accordingly, the proposals to increase hopping bandwidth must be abandoned or, at least, accompanied by other rule changes that will increase the signal rejection capabilities of spread spectrum devices from ISM emissions.

Respectfully submitted



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